

5045 - DIESEL ENGINE OPERATION AND MAINTENANCE									
Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)				
Lectures	Practical	Credit			Theory		Practical Ex.	Total	
3	2	5	25	25	3 Hrs	100	25 oral	175	
Pre-requisite		Source			Theory	Test	Total	TW	PR
Nil		MEC	Semester		75	25	100	25	25
									Gr Total
									150

RATIONALE: Technicians specialised in the operation and maintenance of the most widely used prime mover, the diesel engine. It is therefore essential that sufficient knowledge and skills are imparted to the students in this area. The course provides for familiarisation with the various applications of diesel engine and role of maintenance associated with them. Wide range of activities vis-à-vis operations of diesel engine are also covered in this course. The course aims at providing a brief introduction to various maintenance strategies and thorough knowledge about trouble shooting and over hauling of diesel engines.

Course Content	Hrs	Mks
1. DIESEL ENGINE FUNDAMENTALS & APPLICATIONS Engine terminology & classification of C.I. engines, cycle of operation, two stroke & four stroke engine, valve timing diagram, stages of combustion, various applications of diesel engines such as automobile, marine, earthmoving etc.	04	10
2. DIESEL ENGINE SYSTEMS Operation circuit, components, functions of a) Air intake system Scavenging, super-charging; b) Cooling system, methods, piston cooling; c) Lubricating systems, lubricating oil properties, multigrade oils need for oil change, cylinder lubrication; d) Fuel system types, system requirement, fuel oils; e) Starting system.	10	20
3. DIESEL ENGINE OPERATION & SAFETY Starting of diesel engines, precautions to be taken, operating parameters, maintaining records of operation. Engine tune-up-valve tappet clearance, fuel line priming. Operation of fuel pump, injector, Governor, turbocharger, attached pump, gear pump. Crankcase ventilation, crankcase explosion, cylinder relief valve, engine cutout due to lubricating oil, cooling temperature & pressure.	10	22
4. DIESEL ENGINE MAINTENANCE Introduction to various maintenance strategies, preventive maintenance checks for different systems, trouble shooting chart and failure analysis, standard maintenance schedule, need for overhauling, diagnosis before overhauling.	08	16
5. TOOLS & SPARES Tools used such as Torque wrench spanners, feeler gauges, dial Ganges, bore gauges, piston expander, spare parts & catalogues.	04	10
6. ENGINE OVERHAULING Assembly & dismantling of cylinder head, rocker arm-valve Assembly, piston-connecting rod assembly, inspection and servicing of engine components like main bearings, cylinder Block, liners, crankshaft, piston and rings, valves, Salvaging of worn out components, crankshaft grinding, line boring. Honing, valve grinding, commissioning of overhauled engine.	10	22
Total	48	100

TERM WORK:

1. Dismantling and assembly of Diesel Engine
2. Demonstration/construction/testing of a fuel injector.
3. Demonstration/construction of fuel injection pump.
4. Study of lubricating system components.
5. Demonstration of the use of hand tools like torque wrench etc.
6. Practical demonstration /starting of a diesel of a diesel engine (D. G. set)
7. Study/inspection for defects of engine components.

REFERENCE MATERIALS:

1. Automotive Mechanics – Crouse and Anglin
2. Automobile Repair Guide – Durgging .
3. Auto Engg – Kirpal Singh Vol. 2
4. Introduction to Marine Engineering - D. A. Taylor.
5. The running and maintenance of Marine Diesel Engine – John Lamb
6. Diesel Engines – A.J. Wharton.
7. A course in internal combustion engine; Mathur & Sharma

